

इंटरनेट

मानक

Disclosure to Promote the Right To Information

Whereas the Parliament of India has set out to provide a practical regime of right to information for citizens to secure access to information under the control of public authorities, in order to promote transparency and accountability in the working of every public authority, and whereas the attached publication of the Bureau of Indian Standards is of particular interest to the public, particularly disadvantaged communities and those engaged in the pursuit of education and knowledge, the attached public safety standard is made available to promote the timely dissemination of this information in an accurate manner to the public.

“जानने का अधिकार, जीने का अधिकार”

Mazdoor Kisan Shakti Sangathan

“The Right to Information, The Right to Live”

“पुराने को छोड़ नये के तरफ”

Jawaharlal Nehru

“Step Out From the Old to the New”

IS 4055 (1966): Maize (Corn) Oil [FAD 13: Oils and Oilseeds]



“ज्ञान से एक नये भारत का निर्माण”

Satyanarayan Gangaram Pitroda

“Invent a New India Using Knowledge”



“ज्ञान एक ऐसा खजाना है जो कभी चुराया नहीं जा सकता है”

Bhartrhari—Nitiśatakam

“Knowledge is such a treasure which cannot be stolen”

BLANK PAGE



IS : 4055 - 1966

Indian Standard

REAFFIRMED

APR 2004

SPECIFICATION FOR MAIZE (CORN) OIL

(Third Reprint FEBRUARY 1989)

(Incorporating Amendments No. 1 and 2)

UDC 665.333.4

© Copyright 1977

**BUREAU OF INDIAN STANDARDS
MANAK BHAVAN, 9 BAHADUR SHAH ZAFAR MARG
NEW DELHI 110002**

Indian Standard

SPECIFICATION FOR MAIZE (CORN) OIL

Oil and Oilseeds Sectional Committee, CAFDC 5

Chairman

DR J. S. BADAMI

Representing

The Swastik Oil Mills Ltd, Bombay

*Members*SHRI V. A. PARIKH (*Alternate to*
Dr J. S. Badami)DR K. T. ACHAYA Regional Research Laboratory (CSIR), Hyderabad
DR G. LAKSHMINARAYANA (*Alternate*)SHRI V. P. ANANTANARAYANAN Directorate of Marketing & Inspection (Ministry of
Food & Agriculture), NagpurSHRI V. CHANDRAMOULY (*Alternate*)

SHRI R. C. DAS GUPTA National Test House, Calcutta

SHRI K. C. MEHTA (*Alternate*)

SHRI N. DESIKACHAR The Tata Oil Mills Co Ltd, Bombay

DR B. G. GUNDE (*Alternate*)

DR K. C. GULATI Indian Agricultural Research Institute, New Delhi

DR G. S. HATTIANGDI Hindustan Lever Ltd, Bombay

SHRI K. P. JAIN Directorate of Sugar & Vanaspati (Ministry of
Food & Agriculture)SHRI F. G. T. MENEZES (*Alternate*)

DR S. M. KAJI Italab Private Ltd, Bombay

SHRI J. C. DEY (*Alternate*) (Calcutta)SHRI S. S. HONAVAR (*Alternate*) (Madras)DR B. D. NARANG Central Committee for Food Standards (Ministry of
Health)SHRI D. S. CHADHA (*Alternate*)

SHRI N. P. NOPANI Bombay Oilseeds & Oils Exchange Ltd, Bombay

SHRI CHARANDAS V. MARIWALA (*Alternate*)

SHRI V. M. PAI Godrej Soaps Private Ltd, Bombay

SHRI B. V. KANTAK (*Alternate*)SHRI S. S. RAMASWAMY The Vanaspati Manufacturers' Association of India,
Bombay

DR H. G. R. REDDY Directorate General of Technical Development

REPRESENTATIVE Oil Technological Research Institute, Anantapur

SHRI RAM SHARMA Solvent Extractors' Association of India, Bombay

SHRI P. P. SHARMA (*Alternate*)

SHRI P. V. SHRIKANTA RAO Khadi and Village Industries Commission, Bombay

SHRI P. V. GUJARATHI (*Alternate*)*(Continued on page 2)*

IS : 4055 - 1966

(Continued from page 1)

Members

| | |
|---|--|
| SHRI L. R. SUD | Ministry of Defence (R & D) |
| SHRI A. P. CHAKRAVERTY (<i>Alternate</i>) | |
| DR SADGOPAL, | Director General, ISI (<i>Ex-officio Member</i>) |
| Director (Chem) | |

Representing

Secretaries

SHRI S. SUBRAHMANYAN
Deputy Director (Chem), ISI

SHRI R. C. MISRA
Assistant Director (Chem), ISI

Oils and Fats Subcommittee, CAFDC 5: 1

Convener

DR G. S. HATTIANGDI Hindustan Lever Ltd, Bombay

Members

| | |
|---|---|
| SHRI V. U. MARBALLI (<i>Alternate to</i> Dr G. S. Hattiangdi) | |
| DR K. T. ACHAYA | Regional Research Laboratory (CSIR), Hyderabad |
| DR G. LAKSHMINARAYANA (<i>Alternate</i>) | |
| SHRI GOKULCHAND J. AGARWAL | Bombay Oilseeds and Oils Exchange Ltd, Bombay |
| SHRI CHARANDAS V. MARIWALA (<i>Alternate</i>) | |
| SHRI V. P. ANANTANARAYANAN | Directorate of Marketing & Inspection (Ministry of Food & Agriculture), Nagpur |
| SHRI V. CHANDRAMOULY (<i>Alternate</i>) | |
| DR H. R. CAMA | Indian Institute of Science, Bangalore |
| DR K. C. DANDONA | The East Asiatic Co (India) Pvt Ltd, Madras |
| SHRI N. DESIKACHAR | The Tata Oil Mills Co Ltd, Bombay |
| DR B. G. GUNDE (<i>Alternate</i>) | |
| SHRI S. C. GHOSE | Indian Soap and Toiletries Makers' Association, Calcutta |
| SHRI F. G. T. MENEZES | Directorate of Sugar & Vanaspati (Ministry of Food & Agriculture) |
| SHRI RUP KISHORE (<i>Alternate</i>) | |
| SHRI B. S. MODI | The Vanaspati Manufacturers' Association of India, Bombay |
| DR K. S. MURTI | Tungabhadra Industries Ltd, Kurnool |
| DR H. G. R. REDDY | Directorate General of Technical Development |
| SHRI L. R. SUD | Ministry of Defence (R & D) |

AMENDMENT NO. 3 JULY 1989
TO
IS : 4055 - 1966 SPECIFICATION FOR
MAIZE (CORN) OIL

(*Page 4, clause 2.1.1*) — Substitute the following for the existing clause:

'2.1.1 Refined Maize Oil — Refined maize oil means oil which is obtained by expression or solvent extraction of maize oil bearing materials, deacidified either with alkali or physical refining or by miscella refining by bleaching with adsorbent earth and/or carbon and deodorized with steam.'

(*Page 4, clause 4.2*) — Substitute the following for the existing clause:

'4.2 Admixture with Other Oils — The material shall be free from admixture of other oils.

4.2.1 The material shall be free from non-edible oils when tested according to 9, 10, 11, 12, 14, 15 and 16 of IS : 548 (Part 2) - 1976*.'

(*Page 5, clause 6.2*) — Add the following after 6.2:

'6.2.1 The containers may also be marked with the Standard Mark:

NORM — The use of the Standard Mark is governed by the provisions of the Bureau of Indian Standards Act, 1986 and the Rules and Regulations made thereunder. The Standard Mark on products covered by an Indian Standard conveys the assurance that they have been produced to comply with the requirements of that standard under a well-defined system of inspection, testing and quality control which is devised and supervised by BIS and operated by the producer. Standard marked products are also continuously checked by BIS for conformity to that standard as a further safeguard. Details of conditions under which a licence for the use of the Standard Mark may be granted to manufacturers or processors may be obtained from the Bureau of Indian Standards.'

*Methods of sampling and test for oils and fats: Part 2 Purity test.

**AMENDMENT NO. 4 SEPTEMBER 1995
TO
IS 4055 : 1966 SPECIFICATION FOR MAIZE (CORN)
OIL**

(*Page 3, Foreword, clause 0.3*) — Add the following clause 0.4 after clause 0.3 and renumber the subsequent clause:

'0.4 A scheme for labelling environment friendly products to be known as ECO Mark has been introduced at the instance of the Ministry of Environment and Forests (MEF). The ECO Mark shall be administered by the Bureau of Indian Standards (BIS) under the BIS Act, 1986 as per the Resolution No. 71 dated 20 February 1991 as published in the Gazette of the Government of India vide GSR 85(E) dated 21 February 1991. For a product to be eligible for marking with the ECO Mark it shall also carry the Standard Mark of BIS for quality besides meeting additional optional environment friendly (EF) requirements. The EF requirements for maize (corn) oil are therefore being included through an amendment.

This amendment is based on the Gazette Notification No. 678 dated 30 August 1994 for Labelling Edible Oils, Tea and Coffee as environment friendly products, published by the Ministry of Environment and Forests.'

(*Page 4, clause 4.3*) — Add the following clauses after clause 4.3:

'4.4 Optional Requirements for ECO Mark

4.4.1 General Requirements

4.4.1.1 The product shall conform to the requirements of quality prescribed under clauses 4.1 to 4.3.

4.4.1.2 The manufacturers shall produce to BIS environmental consent clearance from the concerned State Pollution Control Board as per the norms laid down under the Water (*Prevention and Control of Pollution*) Act, 1974; Air (*Prevention and Control of Pollution*) Act, 1981; Water (*Prevention and Control of Pollution*) Cess Act, 1977, respectively, along with the authorization, if required under the *Environment (Protection) Act*, 1986, while applying for ECO Mark.

4.4.2 Specific Requirements

(Page 5, clause 8.2) — Add the following Appendix after clause 8.2:

'APPENDIX A
(Clause 4.4.2.1)

DETERMINATION OF AFLATOXIN

A-1 REAGENTS

A-1.1 Acetone, 70 Percent — 700 ml acetone in 300 ml distilled water.

A-1.2 Acetone, 20 Percent — 200 ml acetone in 800 ml distilled water.

A-1.3 Lead Acetate, 20 Percent — 200 g neutral acetate in distilled water and 3 ml glacial acetic acid, diluted to one litre.

A-2 PROCEDURE

A-2.1 Dissolve 30 g sample in 100 ml hexane.

A-2.2 Extract with 3 × 50 ml 70 percent acetone.

A-2.3 To the extract add 60 ml distilled water and 20 ml lead acetate.

A-2.4 Boil to reduce volume to 150 ml. Cool to about 20°C.

A-2.5 Filter and wash with 20 percent acetone.

A-2.6 Extract filtrate and washings with 3 × 50 ml chloroform.

A-2.7 Pass chloroform layer through anhydrous sodium sulphate.

A-2.8 Concentrate to 50 ml and spot on TLC plate.

A-3 CALCULATION

$$\text{Aflatoxin, mg/kg} = \frac{V \times s \times 1\,000}{v \times m}$$

where

V = volume of extract in ml,

v = volume of extract giving minimum observable fluorescence in μl ,

m = mass of sample in g, and

s = standard toxin giving minimum observable fluorescence in μg .

(FAD 44)

Amend No. 4 to IS 4055 : 1966

4.4.2.1 The product shall not contain aflatoxin, more than 5 mg/kg, when tested by the method prescribed in Appendix A.

4.4.2.2 The pesticide residues, if any, shall not exceed the tolerance limits as prescribed in the *Prevention of Food Adulteration Act, 1954* and *Rules* made thereunder.

4.4.2.3 Only permitted antioxidants not exceeding the quantities specified against each as prescribed under the *Prevention of Food Adulteration Act, 1954* and *Rules* made thereunder, shall be used, if required.

4.4.2.4 The product shall not contain any of the toxic metals in excess of the quantities prescribed in Table 2.

TABLE 2 LIMITS FOR TOXIC METALS

| Sl. No. | CHARACTERISTIC | REQUIREMENT | METHOD OF TEST, REF TO |
|---------|--------------------------------------|-------------|------------------------|
| i) | Lead, mg/kg, <i>Max</i> | 5.0 | 15 of IS 1699 : 1995* |
| ii) | Arsenic, mg/kg, <i>Max</i> | 0.5 | do |
| iii) | Cadmium, mg/kg, <i>Max</i> | 1.0 | do |
| iv) | Mercury (total) mg/kg, <i>Max</i> | 0.25 | do |

* Methods of sampling and test for food colours (second revision).

(Page 4, clause 5.1) — Add the following clause 5.1.1 after clause 5.1:

‘5.1.1 For ECO Mark the product shall be packed in such packages which are made from recyclable (that is which can be re-processed to manufacture any useful product) or biodegradable materials.’

(Page 5, clause 6.2) — Add the following clause 6.3 after clause 6.2:

‘6.3 For ECO Mark, the containers shall be marked with the following information:

- a) List of identified critical ingredients in descending order of quantity, percent by mass, which shall include ‘made from maize (corn) oil’;
- b) The brief criteria for which the product has been labelled for ECO Mark; and
- c) Shelf life of the product.’

**AMENDMENT NO. 5 MARCH 2002
TO
IS 4055 : 1966 SPECIFICATION FOR MAIZE
(CORN) OIL**

(Amendment No. 4, page 2, clause 4.4.2.1) — Substitute '5 µg/kg' for '5 mg/kg'.

(FAD 44)

Reprography Unit, BIS, New Delhi, India

Indian Standard

SPECIFICATION FOR MAIZE (CORN) OIL

0. FOREWORD

0.1 This Indian Standard was adopted by the Indian Standards Institution on 24 November 1966, after the draft finalized by the Oils and Oilseeds Sectional Committee had been approved by the Chemical Division Council and the Agricultural and Food Products Division Council.

0.2 Maize (corn) oil is obtained from the germs of the seeds of plant *Zea mays* Linn. fam. Gramineae, which are separated from the remainder of the kernel by the wet or dry milling process when the latter is prepared for the manufacture of starch or glucose. The oil is marketed as an edible oil in various countries, notably in Europe and USA. So far, the maize oil produced in India has been used in the manufacture of non-edible industrial products, such as the soaps made in the small scale sector. In view of the scarcity of edible oils in the country and also the fact that maize oil is an edible nutritious fat, it was felt that the publication of a national standard would aid the development of the maize oil industry so that a material of a uniform quality could be marketed for edible purposes.

0.3 This standard is based on the accumulated technical experience an analytical data of producers, consumers and technologists in the country. Assistance has also been derived from the information given in the following publications:

B.S. 657: 1950 Crude maize oil. British Standards Institution.

AOCS Table 1 Physical and chemical characteristics of oils, fats and waxes. Chicago. American Oil Chemists Society, 1946. P 1-46.

The Pharmacopoeia of the United States of America. 1960. Seventeenth Revision. Committee of Revision and Board of Trustees, US Pharmacopoeial Convention, Inc., Washington.

1. SCOPE

1.1 This standard prescribes the requirements and the methods of sampling and test for maize (corn) oil.

2. TERMINOLOGY

2.1 For the purpose of this standard, the definitions given under 2 of IS: 548-1964* and the one given below, shall apply.

2.1.1 Refined Maize Oil — Maize oil which has been refined by neutralization with alkali, bleached with bleaching earth or activated carbon or both, and deodorized with steam.

3. GRADES

3.1 The material shall be of two grades, namely:

- a) *Raw* for industrial uses, and
- b) *Refined* for edible purposes.

4. REQUIREMENTS

4.1 Both the grades of the material shall be obtained from the germs of clean and sound seeds harvested from the plant *Zea mays* Linn. fam. Gramineae, by a process of expression.

4.1.1 The material shall be clear and free from rancidity, adulterants, sediment, suspended and other foreign matter, separated water and added colouring and flavouring substances.

4.1.2 The clarity of the material shall be judged by the absence of turbidity after keeping the filtered sample at 30°C for 24 hours.

4.2 Admixture with Other Oils — The material shall be free from admixture with other oils, when tested according to the methods prescribed under 20 of IS: 548-1964*.

4.3 The material shall also comply with the requirements given in Table 1.

5. PACKING

5.1 The material shall be supplied in suitable well-closed containers as agreed to between the purchaser and the supplier.

6. MARKING

6.1 The containers shall be marked with the name and weight of the material in the container; manufacturer's name and trade-mark, if any; batch number, and the month and the year of manufacture.

6.2 In the case of raw oil, the containers shall also be suitably marked 'FOR INDUSTRIAL NON-EDIBLE USES ONLY' (either printed on

*Methods of sampling and test for oils and fats (*revised*).

the label affixed to the container or lithographed or stencilled thereon with indelible ink).

TABLE 1 REQUIREMENTS FOR MAIZE OIL

(Clauses 4.3 and 8.1)

| SL No. | CHARACTERISTIC | REQUIREMENT | | METHOD OF TEST (REF TO CL No. IN IS: 548- 1964*) |
|-----------|--|--------------------------|--------------------------|---|
| | | Raw | Refined | |
| (1) | (2) | (3) | (4) | (5) |
| i) | Moisture and insoluble impurities, percent by weight, <i>Max</i> | 0.25 | 0.15 | 5 and 6 |
| ii) | Colour in a $\frac{1}{2}$ -in cell on the Lovibond scale, expressed as (Y+5R), not deeper than | 25 | 10 | 13 |
| iii) | Refractive index at 40°C | 1.464 5 to 1.467 5 | 1.464 5 to 1.467 5 | 10 |
| iv) | Specific gravity at 30°/30°C | 0.923 to 0.926 | 0.913 to 0.920 | 11 |
| v) | Saponification value | 187 to 195 | 187 to 195 | 15 |
| vi) | Iodine value (Wijs) | 103 to 128 | 103 to 128 | 14 |
| vii) | Acid value, <i>Max</i> | 8.0 | 0.5 | 7 |
| viii) | Unsaponifiable matter, percent by weight, <i>Max</i> | 2.5 | 1.5 | 8 |

*Methods of sampling and test for oils and fats (*revised*).

7. SAMPLING

7.1 Representative samples of the material shall be drawn as prescribed under 3 of IS: 548-1964*.

8. TESTS

8.1 Tests shall be carried out as prescribed in IS: 548-1964*. Reference to the relevant clauses of that standard is given in col 5 of Table 1.

8.2 Quality of Reagents — Unless specified otherwise, pure chemicals and distilled water (*see* IS: 1070-1960†) shall be used in tests.

NOTE — 'Pure chemicals' shall mean chemicals that do not contain impurities which affect the results of the analysis.

*Methods of sampling and test for oils and fats (*revised*).

†Specification for water, distilled quality (*revised*).

BUREAU OF INDIAN STANDARDS

Headquarters :

Manak Bhavan, 9 Bahadur Shah Zafar Marg, NEW DELHI 110002

Telephones : 3 31 01 31, 3 31 13 75

Telegrams : Manaksanstha
(Common to all Offices)

Regional Offices :

Telephone

*Western : Manakalaya, E9 MIDC, Marol, Andheri (East), BOMBAY 400093 6 32 92 95

†Eastern : 1/14 C. I. T. Scheme VII M, V. I. P. Road, Maniktola, CALCUTTA 700054 36 24 99

Northern : SCO 445-446, Sector 35-C CHANDIGARH 160036 { 2 18 43
3 16 41

Southern : C. I. T. Campus, MADRAS 600113 { 41 24 42
41 25 19
41 29 16

Branch Offices :

Pushpak, Nurmohamed Shaikh Marg, Khanpur, AHMADABAD 380001 { 2 63 48
2 63 49

'F' Block, Unity Bldg, Narasimharaja Square, BANGALORE 560002 22 48 05

Gangotri Complex, 5th Floor, Bhadbhada Road, T. T. Nagar, BHOPAL 462003 6 27 16

Plot No. 82/83, Lewis Road, BHUBANESHWAR 751002 5 36 27

53/5 Ward No. 29, R. G. Barua Road, 5th Byelane, GUWAHATI 781003 -

5-8-58C L. N. Gupta Marg, (Nampally Station Road), HYDERABAD 500001 22 10 83

R14 Yudhister Marg, C Scheme, JAIPUR 302005 { 5 34 71
6 98 32

117/418B Sarvodaya Nagar, KANPUR 208005 { 21 68 76
21 82 92

Patliputra Industrial Estate, PATNA 800013 6 23 05

Hantex Bldg (2nd Floor), Rly Station Road, TRIVANDRUM 695001 52 27

Inspection Office (With Sale Point):

Institution of Engineers (India) Building, 1332 Shivaji Nagar, PUNE 410005 5 24 35

*Sales Office in Bombay is at Novelty Chambers, Grant Road, Bombay 400007 39 65 28

†Sales Office in Calcutta is at 5 Chowringhee Approach, P. O. Princep Street, Calcutta 700072 27 68 00

Reprography Unit, BIS, New Delhi, India